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Wildlife

IN NORTH CAROLINA

TEN CENTS

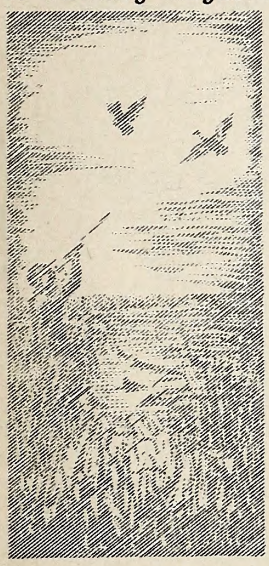
JANUARY 1949

re below was taken at Lake Mattamuskeet, scene of one of the greatest concentrations of Geese in the United States. Waterfowl must have a safe win-g-over place to insure a breeding stock of birds for next year's production.

WILDLIFE IN NORTH CAROL

The Official Publication of The North Carolina Wildlife Resources Commissi

A monthly magazine devoted to the protection and restoration of our Wildlife
improvement of hunting and fishing in North Carolina



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January 1949 **Vol. XIII No. 1**

COVER

The cover scene is reproduced from an oil painting by artist Win Donat. Win is entering competition with other wildlife artists to produce the design for next year's Migratory Waterfowl Stamp.

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Wildlife in North Carolina recognizes the need for close coöperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication all news items, articles, photographs, and other material dealing with the various activities which combine to make North Carolina a better state for hunting and fishing. Full credit is given for all material published.

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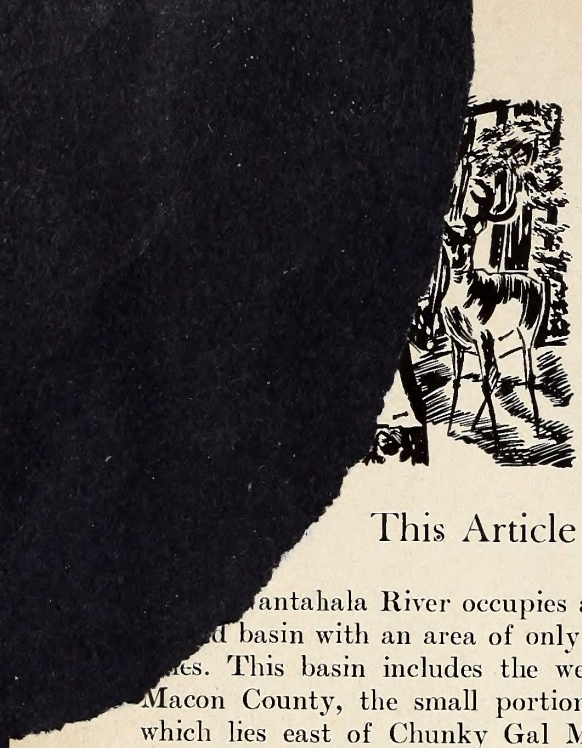
January marks the beginning of a new year and the approaching end of one of the most significant decades in history. It is time to re-consecrate ourselves to the protection and restoration of renewable natural resources which were so wantonly expended during the greatest struggle the world has ever known. By the wise use of our wildlife resources we can help to rehabilitate the greatest of all resources—humanity.

Rod Amundson, *Editor.*



A SURVEY OF THE Nantahala River System

By Yates Barber

Senior Student of Wildlife Management
N. C. State College

This Article Concludes The Series on Stream Surveys.

antahala River occupies a narrow, crescent d basin with an area of only about 117 square es. This basin includes the western one-fifth of Macon County, the small portion of Clay County which lies east of Chunky Gal Mountain, and the southwestern tip of Swain County. The Nantahala forms the boundary between Clay and Macon counties for about six miles above Aquone Reservoir.

The Nantahala has its beginning as several small branches and trickles at about 4,500 ft. elevation on the slopes of Standing Indian and Little Ridgepole mountains near the Georgia-North Carolina State Boundary. From this point the Nantahala flows generally northwest for almost half its length to Aquone Reservoir, then northward several miles to the head of the beautiful Nantahala Gorge. The course of the stream through the gorge and after it leaves the gorge is in a northeasterly direction for the remaining one-third of the stream's length. At Almond, at 1,500 ft. elevation, the Nantahala unites with the Little Tennessee River in Fontana Reservoir which now fills the stream valley of the Little Tennessee at this point.

The Nantahala Mountains form the eastern boundary of the Nantahala Basin while the western boundary is formed by Standing Indian and Chunky Gal mountains, and the Tusquitee, and the Snowbird Mountains from south to north respectively.

The previously mentioned Aquone Reservoir is formed by a dam near Lambert Mountain. Water is piped from the reservoir to the hydro plant of the Nantahala Power Company near the head of the gorge. This of course results in a greatly reduced flow in the Nantahala River from the Dam to the hydro plant. What is lost in trout fishing here, however, is more than compensated for in the many excellent catches of smallmouth bass, crappie, and bluegill sunfish which are made in the reservoir each year.

In the gorge, for about six miles, the Nantahala offers real enjoyment to the devotees of the sport of canoeing. The many white water areas offer ample opportunity for the canoeist to test his skill.

The narrow basin of the Nantahala causes this to be a stream with very few tributaries of any size. White Oak, Jarret's, and Buck creeks, though still small streams, are the largest tributaries. Wine Spring, Dick's, and Otter creeks, and Bryson Branch were the only other streams of sufficient size to warrant survey stations. Of the total sixty miles of game fish water in the system, seven miles is already under management in the Standing Indian Management Area. This management area is on U. S. Forest Service Land and is operated coöperatively by the U. S. Forest Service and The North Carolina Wildlife Resources Commission, as are several other management areas in Western North Carolina.

Fortunately for both the trout and the trout fisherman, most of the Nantahala watershed is steep mountain slopes with only a little land in the valleys suited to agriculture and pasturage. This is especially true of the Nantahala above the gorge. More than 50 per cent of the Nantahala Watershed is now owned by the U. S. Forest Service, which means that the watersheds of most of the streams have better than average forest cover with insured protection for the future against the worst enemies of all wildlife, fire and ruthless lumbering. This Forest Service land constitutes part of the Nantahala National Forest.

Dick's Creek is in an area which had recently been logged and is somewhat exposed to the rays of the sun along its lower reaches, but the temperature recorded by the survey party in this stream was still favorable for trout despite this exposure.

Erosion, Silting and Pollution

Whiteoak Creek and one of its tributaries, Otter Creek, were the only two streams where there was evidence of silting. The valleys of these two streams are probably the most extensively cultivated in the Nantahala watershed, and the silting is at least partly a result of this.

A common feature of mountain roads, wherever they occur, is that they generally follow streams and stream valleys. This is perfectly logical since

it is generally here that the most gentle grades in such an area occur and it is in the valley floors that the most fertile and best agricultural land is found. Early settlers naturally first occupied this land and roads were first built along the valley floors where construction of the road was least difficult. Modern roads have largely followed the older roads in areas where they existed. Most of these newer roads, however, are still of dirt and gravel construction and many cuts and fills have been left bare without the protection of vegetative covering. The frequent mountain showers wash large quantities of soil and minerals from these exposed places into otherwise clear paralleling streams, dooming them to perpetual murkiness. A sharp thunder shower may, within five minutes, transform a relatively clear road-bordered stream, into a muddy, red torrent. Much of this material settles out or is carried on by the stream within a day or two, but fine colloidal particles of soil remain suspended in the water for days and even weeks. Seldom does such a stream clear entirely before its load is renewed by the next downpour.

Trout are affected adversely by muddy water in at least two ways. The first is that the fish have more difficulty in seeing their food and the second and perhaps most important is that the continual silting, which accompanies muddy water, tends to fill in between the gravel and rubble on the bottom, destroying the habitat for many aquatic insects, a primary item in the diet of trout.

Many streams in the Nantahala share their valleys with man's highways. The streams which seemed most affected by them were Whiteoak, Otter, Jarret, and Dick's creeks. The Rainbow Springs road from Rainbow Springs to Aquone causes some muddiness of the Nantahala where they run closely parallel. The Nantahala now shares the floor of its magnificent gorge with not only a highway but also a railroad. These, however, are modern structures, the highway is hardsurfaced and fills and cuts are clothed with vegetation. These cause little damage to the stream other than a few places where their close proximity results in inadequate stream side cover, thus exposing the stream to the warming rays of the sun.

There is not a single village of more than a few houses in the entire Nantahala watershed and therefore there are almost no industries to pollute the streams. Some mica washing is carried on in the Nantahala near the village of Nantahala, but this apparently has not affected the stream materially to date, perhaps because of the very swift flow of water through the gorge which tends to minimize the deposition of silt in the stream channel at this point.

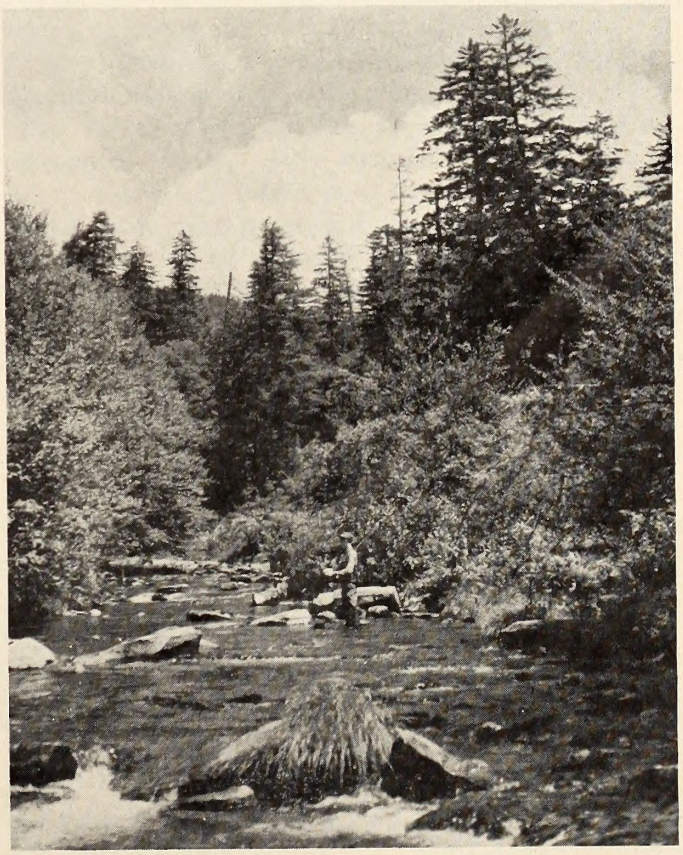
Food Conditions

Aquatic insect larvae, though still scarce enough to be classified as poor in every instance but one, were generally more abundant throughout the Nantahala system than in any other surveyed by the party during the summer. This is probably at least partly the result of the clean, cool waters seeping from the large amount of woodland in the watershed. At the water gauge station on Rainbow Springs road a quantitative analysis was made of food conditions. Fifty-one organisms, with a volume of slightly more than one cubic centimeter per square foot of stream bottom were found. This placed this portion of the stream in the category of medium in the amount of food available to fish. Sixty-five per cent of this food was caddis fly larvae (stick bait), the odd shaped fibrous cases of which gave the rocks of the stream bottom a speckled appearance. Crayfish, salamanders, and forage fish were also relatively abundant throughout the system and were not included in the quantitative studies. All of the above mentioned organisms are readily acceptable food items of trout and probably constitute an important portion of the food taken by trout wherever they are abundant.

Quantitative studies made at the warden's cabin in the management area and at the village of Nantahala in the gorge showed 8.0 organisms with a vol. of 0.2 cc and 50 organisms with a vol. of 0.29 cc respectively.

Temperature Data

Every temperature recorded in the Nantahala system by the survey party was favorable to some



Forest management will benefit streams such as this in the Nantahala River system.

species of trout. Sixty-two degrees Fahrenheit was the minimum recorded and 70 per cent Fahrenheit was the maximum. The latter temperature was found in the Nantahala River in the gorge near the village of Nantahala. These low temperatures unquestionably reflect the type of land use prevalent in the Nantahala watershed.

Rain water is held in the forest litter on the mountain slopes. After percolating and seeping through the earth it emerges as clear, cool spring water which feeds the mountain brooks. The forest trees and shrubs provide abundant streamside cover, protecting these streams from the warm rays of the sun. The temperature of water in streams fed and protected in such a way remain low and favorable to trout.

Chemical Data

The results of the three series of chemical analyses, which were made at various points on the Nantahala River, were typical of those usually obtained in clean, cool mountain streams. Dissolved oxygen content was high, 9.0 to 10.0 parts per million of water, while dissolved carbon dioxide was low, running from 1.1 to 1.5 parts per million. The pH was 6.9, slightly acid, in one case but ran 7.1 and 7.2, slightly alkaline, in the other two tests.

Alkalinity tests showed that carbonates were present only to the extent of 3.5 to 7.0 parts per million of water. The latter condition is, to a large extent, responsible for the poor food conditions found in most mountain streams. This scarcity of plant nutrients in the water results in the growth of fewer microscopic plants than are found in richer waters. These microscopic plants are fed upon by various microscopic and nearly microscopic animals, which in turn are devoured by insect larvae, small fish, crayfish, and various other aquatic organisms which may also devour each other. The latter group of animals are the prey of trout and other fishes. Each group is directly affected by the abundance of the lesser group upon which it feeds, and by tracing back along this food chain one can readily see how the abundance of fish in a stream may be affected by the chemical nutrients present in the water. It is of course true that some food is obtained by fish, and the other organisms, in the form of insects which fall into the water. The amount of this food becoming available to the fish is directly affected by the amount and type of vegetation growing along the streambank, an already important factor in maintaining low stream temperatures, and preventing stream bank erosion.

Status of Game Fish

All the streams surveyed in the Nantahala watershed were found to be suitable for trout. These streams totaled sixty miles, of which 6.5 miles are suited to brook trout. The remaining 53.5 miles are suited to rainbow trout. Of the latter mileage, seven miles are already under management in the Standing Indian Management Area. This area consists of the upper seven miles of the Nantahala River and these waters are well stocked with rainbows. The management area also includes many miles of small tributaries which are well stocked with brook trout. As these were already under management, they were not surveyed by the stream survey party, and therefore are not included in the mileages listed above. The best trout fishing in the watershed is found in the management area. The Nantahala River is controlled by a private fishing club for about five miles below the management area, and this portion of the stream is closed to public fishing.

Mileage of Waters Suitable for Management

Stream	*Brook Trout*	*Rainbow-Trout*
Wine Spring Creek		2.5
Jarret Creek		3.5
Bryson Creek	3.5	
Buck Creek		6.5
Dick's Creek	3.0	
White Oak Creek		6
Otter Creek		2
Nantahala River*		35
Total	6.5	55.5

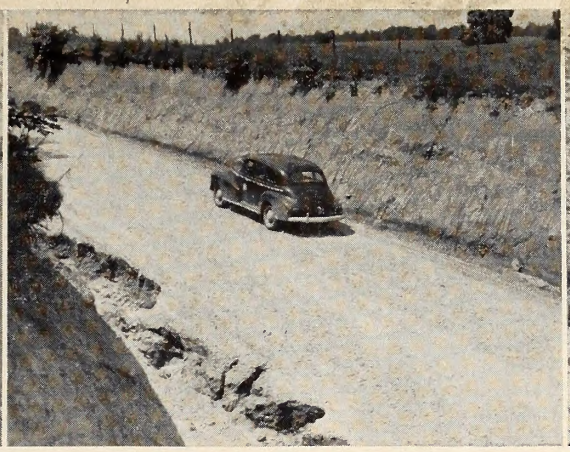
*Including 7 miles already under management in the Standing Indian Management Area.

Table 2. Mileage of waters of the Nantahala River which are suitable for management.

Natives reported that since the construction of the reservoir, warm water species, such as smallmouth bass, and bluegill sunfish, have migrated up the stream in large numbers and are competing seriously with the trout for food. In the cooler waters of the stream the warm water species are unable to reproduce and their growth is retarded. This condition is similar to that found in many of our trout streams which flow into reservoirs and large lakes, and can probably be best remedied by the construction of log or stone barriers placed just upstream from the high water mark of the reservoir. In this way no migration of new individuals from the lake would be possible and with those above unable to reproduce, it would only be a matter of time until fishermen and natural causes eliminated the undesirable species from the trout streams.

In Nantahala Gorge, below the Nantahala Power Company Hydro Plant, one finds the Nantahala racing madly over rocks and rapids on its way to the sea. It is here that the big rainbows are taken. The accepted method seems to be that of using a

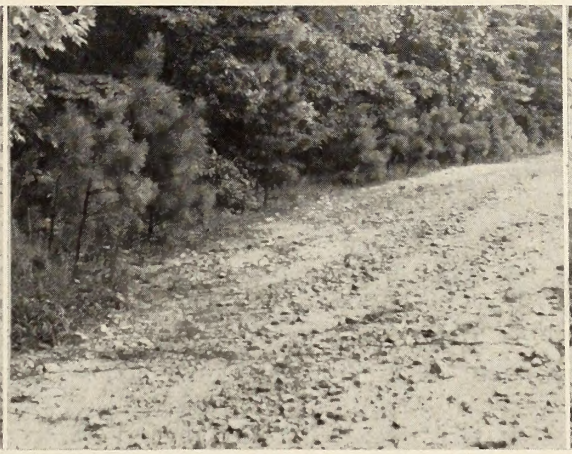
(Continued on page ten)



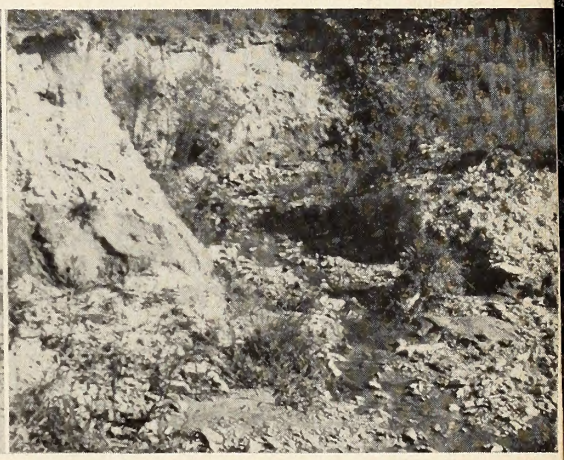
Here is visible evidence that priceless topsoil is washing away. Roadside erosion is not only unsightly, but costly, since washed-out grades must be repaired. To leave a plowed hillside fallow is to ask for trouble. Soft, loose soil is sure to yield to the onslaught of repeated rains. Cover vegetation would prevent this erosion.

Why Are Our Rivers Muddy?—SOIL EROSION!

This may be only a small gulley in a broom sedge field, but the gulley will grow if left unchecked.



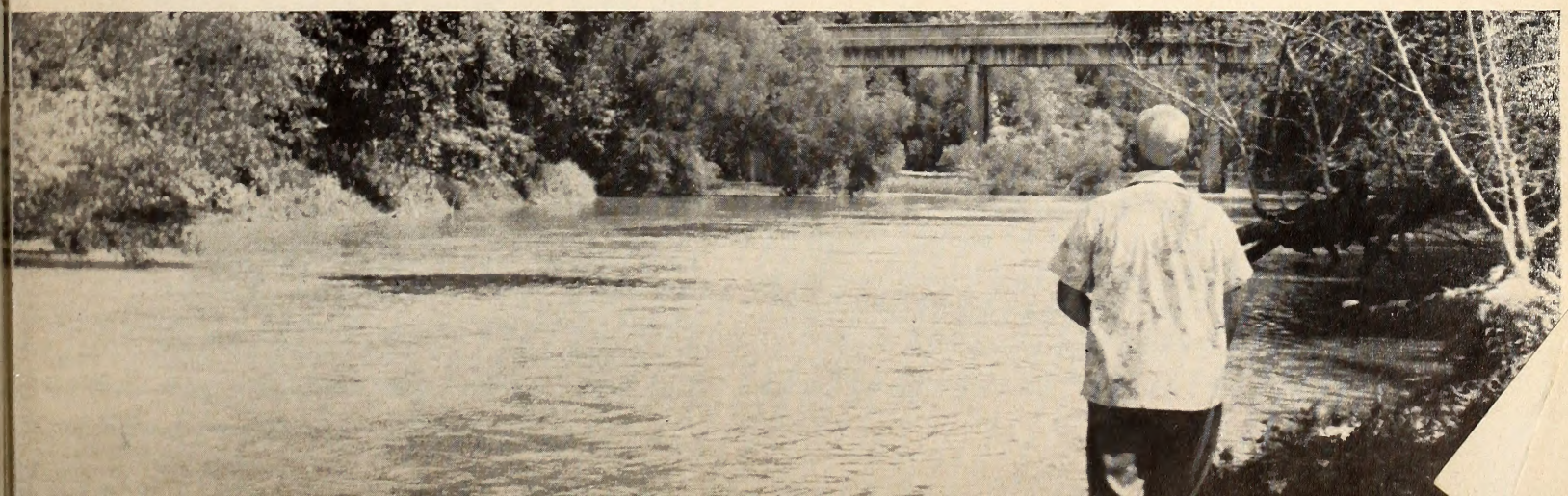
Bare strips between woodlands and fields are unproductive of wildlife. Wildlife plantings here would check erosion and benefit game.



The banks of small streams can be stabilized by vegetation; otherwise they will be continually eaten away, contributing to silt in rivers.

Wise Land Use Through Management of Vegetative Cover Is The Only Way We Can Keep Our Soil and The Life It Supports From Final and Irrevocable Destruction

The end product of soil erosion is a muddy, unsightly, flooded river. Vegetation on the land as a result of good land management not only will prevent soil from washing away—it will hold back run-off water and prevent floods.



Although this is only a brush fire which was kept under control, it easily could have broken away to ruin thousands of acres of valuable timber. Forest fires destroy wildlife and its habitat.

FOREST FIRES Can Be PREVENTED

By Lyle F. Watts,
Chief U. S. Forest Service

Last year forest fires wiped out several communities and made thousands homeless in the State of Maine. Damaging fires occurred in Texas. Forest fires in California cost several lives.

In 1946—the latest year for which complete reports are available—it was estimated that more than 172,000 fires occurred in the forests of the United States. All together, they burned over more than 20 million acres (an area more than six times that of the whole State of Connecticut).

Letting forests burn is like burning up dollar bills, because forests are part of the basic wealth of this country—the real wealth that our dollar bills stand for. When forests burn, valuable timber may be destroyed, timber that could have been converted into lumber for homes, or paper products, or hundreds of other useful products. Many trees not killed outright may be scarred and damaged by fire, so that heart rot enters the wood and spoils their value.

Fire is most damaging to the young trees—the little saplings and seedlings that would make the saw-timber trees of the future. If a forest is to yield a continuing supply of wood, a growing stock of younger trees must always be kept coming along. But fires, together with destructive and wasteful

methods of logging, have converted millions of acres of formerly good timber-growing land in this country into virtually non-productive wasteland.

Fire often kills many birds and animals and may destroy the food plants and shelter that game and wildlife need. Range fires destroy much valuable livestock forage. Fire destroys scenic values, and may hurt the tourist and vacation business which is a principal economic support of many communities. People are not apt to pick a fire-blackened waste as a vacation spot.

Undoubtedly fire's worst damage in many sections is to the watersheds. When fire destroys the protective mantle of trees and shrubs and grasses and the leaf litter on the forest floor, bare soil is exposed, rain water and melting snow run off more rapidly, erosion increases, mud is washed down into the streams. Flood danger increases. With the spongy leaf litter and humus burned away, the soil absorbs less water for underground storage. Springs and wells may run dry. City and community water supplies may be affected. Streamflow may become less regular and dependable, varying from a raging torrent in wet weather to a mere trickle or no flow at all during dry spells.

And another thing—it costs money to fight forest fires. And the cost comes back on us in our tax bills.

How do forest fires start? Some are started by lightning; and we can't do much about that. Until someone comes up with a way to control lightning storms, we shall have to rely on prompt detection and maintenance of well-organized, well-equipped, fast moving fire fighting forces to control lightning-caused forest fires. Lightning-caused fires occur most frequently in the mountainous sections of the western states, where summer thunder storms often come with little or no rain. In the eastern states, where thunder storms are usually accompanied by heavy downpours, fewer lightning-caused fires occur.

But country-wide, only about 10 per cent of the forest fires are caused by lightning. The other 90 per cent are man-caused, and, therefore, are preventable.

Some are started deliberately, perhaps because of a grudge against a neighbor. Some people start fires in the woods in the hope that it will make the woods more open and grassy for grazing their cattle, or with the idea that they can get rid of ticks and other pests. In some sections of the south, woodsburning is still an annual custom, dating back to the days when the settler's chief concern was clearing land for crops or pasture.

But most of the fires are the result of plain carelessness on the part of every day citizens. They are caused by smokers who thoughtlessly flip cigarettes or matches out of car windows as they ride along the highways. They are caused by people who try to burn trash or weeds or brush to clean up a field or garden patch, and who let the fire get away into the woods. They are caused by campers and picnickers who neglect to drown out their camp fires when they break camp or start home from a picnic.

There are laws against all these things. Rangers and forest wardens have authority to arrest a person who starts a forest fire, even if he does it only through carelessness or thoughtlessness. But they much prefer to have people coöperate with them in preventing fires, so that arrests will not be necessary.

Fire is not the only menace to the forests. Destructive insects and diseases cause an even greater loss of saw-timber than does fire. Windstorms and ice storms cause much damage in the forests. Overgrazing in the forests and on mountain ranges can seriously damage vegetative growth and watershed values. Destructive and wasteful methods of logging have depleted timber growing stock over vast areas.

Logging takes a much greater amount of saw-timber from our forests than fire destroys. But if you count in all the billions of young trees and little seedlings—the saw-timber trees of the future—that are wiped out by fires every year, undoubtedly fires destroy many more trees than the sawmills. And when a tree is cut in logging, it ends up in lumber, furniture, newsprint, railroad ties, or other needed and useful commodities. But when fire destroys timber it is pure waste. "Burned timber builds no homes."

Moreover, it is possible to cut timber in such a way that the younger trees are safeguarded and the forest will keep on growing more timber. Many

progressive forest owners are using good cutting practices, and our public forests are generally managed for continuous production of timber, or what foresters call "sustained yield." However, we still have a long way to go to bring about good timber management on all forest-lands. On more than 50 per cent of all our commercial forest lands, cutting practices are still poor or destructive.

Although it will take more than fire prevention alone to build up and maintain our forests for maximum returns in products and benefits, prevention of fire losses is one of the first essentials. And forest fire prevention is something that every one can help on. Any one of us who ever goes into or passes through wooded areas could be the cause of a forest fire if we happened to be careless. And everyone of us can help cut down the huge and costly loss from forest fires by remembering at all times to be careful with our matches, smokes, and fire of any kind in the woods.

A SURVEY OF THE NANTAHALA RIVER SYSTEM

(Continued from page six)

casting rod with a heavy sinker, to which a large spinner and bucktail are fastened by about three feet of sturdy leader. The heavy sinker is necessary in the swift water in order to sink the lure to the depths where the big ones lie. Many rainbows 16 inches and up are taken in this fashion each year, but smaller fish appear to be scarce in the gorge.

The other waters in which rainbows are found included Wine Spring, Otter, Jarret, Whiteoak and Buck creeks. The lower three miles of Buck Creek is closed to public fishing, but much excellent fishing is to be had above the posted portion of the stream.

The two streams which were classified as brook trout waters were Dick's Creek and Bryson Branch, a total of about 6.5 miles of stream. As was previously mentioned, the lower part of Dick's Creek is in an area which was recently logged and because of this is badly exposed here. The headwaters seem well protected, however, and the highest temperature recorded in the lower part of the stream was only 66° Fahrenheit.

Brown trout were not taken by the survey party in any stream in the Nantahala system. As brook and rainbows seem to be holding their own quite well in the Nantahala, it seems inadvisable that brown trout be introduced into the system until such time as changed land use practices may so modify some stream that brooks or rainbows cease to provide good fishing here.

An elephant's trunk contains 40,000 muscles and can perform more services than any other animal part except the human hand.

AH, THE FISHERMAN!

Of all the mortals that inhabit this strife-torn old earth of ours there's nothing quite like the fisherman. An ordinary individual under normal conditions, he can be a ball of fire or the worst bore at a gathering—it depends on how the fish are biting. He is alternately gentle as a spring lamb, or the most dangerous animal not in captivity—according to whether that "strike" was really a bass or a dag-nabbed sunken log.

Wives and children, who know him as a peace-loving, lovable cuss around the home, cringe and quiver in fear when, returning from an unproductive trip, he roars in the negative when asked the stock question, "How was the fishing today?" They know he's lying when, between snorts, he vows he's going to break up his gear or give it away. They know it will still be in the closet a day, a week or a month from now—awaiting his next fishing trip.

Big shot or little shot, he's endowed with the same fever when somebody mentions the fish are biting. The most important business conference can be changed into "that's the best" or "that's the worst" fishing spot in creation simply by the injection of the word "fishing" into the discussion. Street sweeper and financial genius become one and the same personality— the fisherman—on the curbstone as the previous day's catch or the next day's prospects become the most important topic in the world.

Everybody knows he's a liar. There isn't a class of people in existence—not even a general—who hates to admit defeat like the guy with the fancy reel or swamp-cut cane pole. There's never been an ordinary-sized fish that didn't gain one ounce to five pounds when he described it. Only his understanding wife and kids have the real lowdown on his lousy fishing ability.

With all his faults, he's a pretty good sort. He's riding high now that the tarpon, king mackerel, cobia and other battlers are striking in coastal waters and the bass and bream are hitting fairly well in the streams and lakes. He'll not be around the job for the next few days. Ah, the fisherman! God bless him! We need more like him in these torturesome days.

—Tom Ford.

Some lizards incubate their eggs beneath the bark of rotting logs. Because a reptile's body temperature approximates its surroundings, the female leaves her nest periodically to bask in the sun—returning to transmit the warmth to her eggs.

* * *

The humps on the camel are masses of fat serving as a reserve store of food. With hard work or bad feeding, the hump dwindles almost to nothing.

NORTH CAROLINA WILDLIFE RESOUI

A ROUNDUP OF THE LAT

AT A MEETING IN DECEMBER AT RALEIGH THE COMMISSION FORMULATED THE 1949 FISHING REGULATI LAST YEAR'S RULES. THE STATUS OF YELLOW PERCH NIGHT FISHING IN DESIGNATED TROUT STREAMS PROHI FEEDING BROWN TROUT. EXTRACTS OF THE 1949 REGU SOON AFTER JANUARY 1.

* * * *

YELLOW PERCH, WHITE PERCH, AND STRIPED BASS (ROCK FISH) TAKEN IN INLAND WATERS DURING 1949 WILL BE CLASSED AS GAME FISH AND MAY NOT BE SOLD.

* * * *

THE SECOND SESSION OF NORTH CAROLINA'S DOVE SEASON OPENS ON NEW YEAR'S DAY AND CONTINUES THROUGH JANUARY 20. AS IN THE FALL SEASON, SHOOTING HOURS ARE FROM NOON TO SUNSET DAILY, AND THE BAG LIMIT TEN BIRDS PER DAY AND IN POSSESSION. MIGRATORY GAME BIRD STAMPS ARE NOT NECESSARY FOR DOVE SHOOTING.

* * * *

THE SEASON ON BIG GAME SHOOTING THROUGHOUT THE STATE CLOSES AT SUNDOWN JANUARY 1. WATERFOWL SHOOTING ENDS ONE HOUR BEFORE SUNSET ON JANUARY 8, AND SQUIRRELS, RABBITS, QUAIL, GROUSE, AND WILD TURKEYS BECOME ILLEGAL GAME AFTER SUNDOWN ON JANUARY 10.

* * * *

PRODUCTION PLANS ARE BEING CONSIDERED FOR A 3-MINUTE 35-MILLIMETER MOVIE "TRAILER" TO BE EXHIBITED IN MOTION PICTURE THEATERS THROUGHOUT NORTH CAROLINA. THE FILM, IF SUCCESSFUL, WILL BE THE FIRST OF A SERIES DESIGNED TO PROMOTE STATE-WIDE PUBLIC SUPPORT TO NORTH CAROLINA'S WILDLIFE MANAGEMENT PROGRAM. THE UNIVERSITY OF N. C. COMMUNICATIONS CENTER WILL HAVE CHARGE OF PRODUCTION UNDER THE SPONSORSHIP OF THE WILDLIFE RESOURCES COMMISSION.

* * * *

AFTER CONSIDERABLE DELAY THE WILDLIFE COMMISSION HAS RECEIVED DELIVERY OF AN AEROPLANE FOR LAW ENFORCEMENT PATROL. THE PLANE IS CURRENTLY STATIONED AT WILMINGTON, BUT PLANS CALL FOR BASING IT AT THE RALEIGH MUNICIPAL AIRPORT. DELIVERY ON 2-WAY RADIO EQUIPMENT FOR THE PLANE AND FOUR WILDLIFE PATROL CARS IS EXPECTED SOON.

* * * *

WINTER FISHING FOR WARM-WATER SPECIES IS AND FEBRUARY. FISHERMEN WHO GO OUT ON MILD DAYS WHITE GRUBS AND MINNOWS CAN EXPECT GOOD CATCHES.

* * *

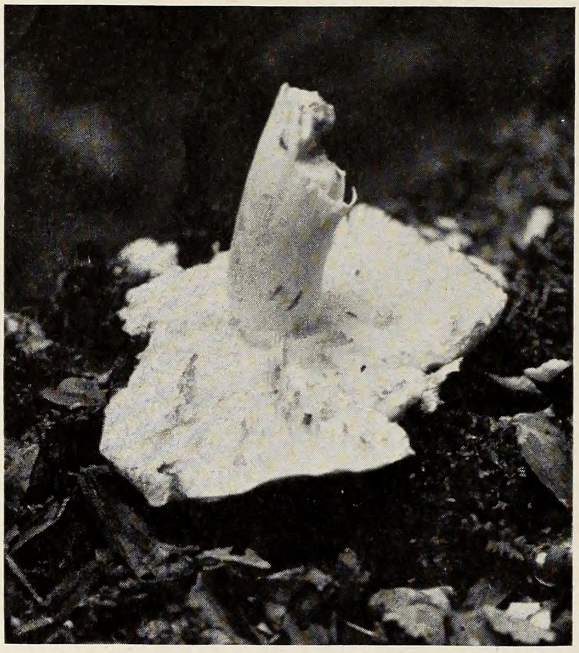
REPORTS FROM LAKE MATTAMUSKEET INDICATE GEESE THAN FOR SEVERAL YEARS PAST,WITH MORE DUC THE SANCTUARY.

* * *

EIGHTY-THREE PERSONS DIED AS A RESULT 1947, ACCORDING TO DR. C. P. STEVICK, STATE EP PLETE SOON. WITH A GREATER NUMBER OF HUNTERS YEAR'S RECORD IS EXPECTED TO EXCEED THE 1947 M FATALITIES FROM TULAREMIA DURING 1947, BUT ONL 15, 1948.

. . . feed on pine cones, remains of which are shown above.

Sumac seeds are food for birds, and the branches and twigs are favored by deer.



Even toadstools are wildlife food. Note tooth marks in the one above.

Winte
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Wil

Nature's larder provides a ide
life species. Although wildlife epe
soil throughout the year, the int
period for food. Unless we sup eme
habitat improvement planting wil
exceed the limitations of a cer ian

Shown here are some wil ife s
they depend for winter survi l.

tion some species are a part of wildlife and depend

Sweet gum balls are loaded with seeds, and are frequently fed on by bears.

Grasses, such as Johnson grass shown above . . . and weeds . . .

e Food
for
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ide variety of foods for wild-
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wildlife populations can never
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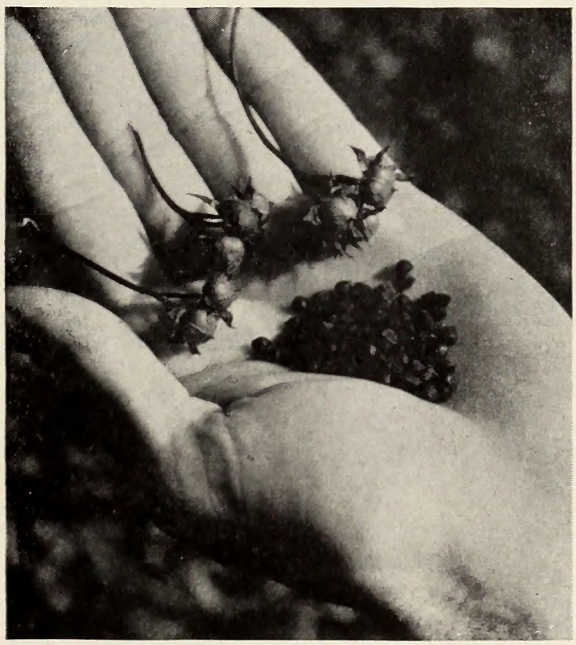
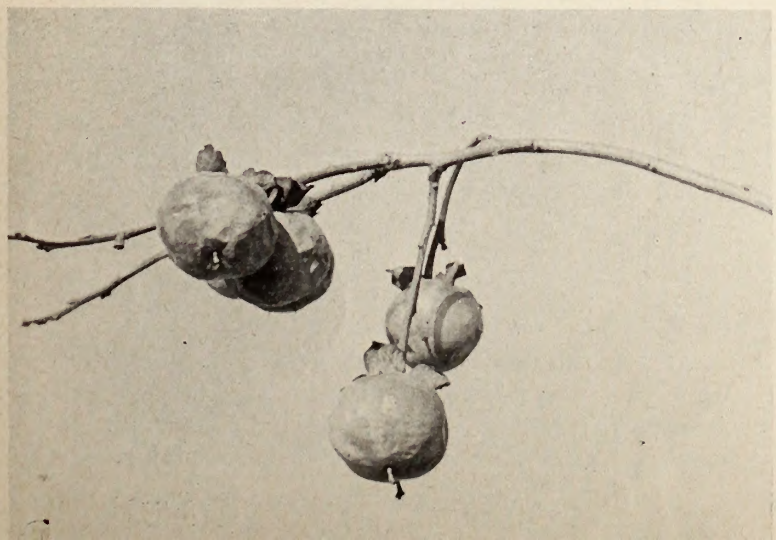
Photos By Jack Dermid



Morning glory plants and vines are productive of wildlife food . . .

. . . and poke berries are a favorite of songbirds as well as game birds and animals.

The fruits of persimmon trees are a delicacy for bears, 'coons, and . . .



BOW TROUT

The First of a Series on Tarheel Fish and Game Species

The robust rainbow trout is not only one of the most beautiful members of this romantic family but also one of the most spectacular and satisfying performers. Its fast and powerful runs interspersed with breath-taking jumps make it a favored individual with veteran trout anglers.

For many years the rainbow trout has been confused with the steelhead trout and until recently the rainbow and steelhead were regarded as two separate species. Scientists now agree that these are one and the same fish—the steelhead merely being a rainbow that has migrated to sea.

In the past, it has been a general custom to call any trout that has migrated to sea a "steelhead." This included cutthroat trout, Dolly Varden trout and even Eastern brook trout. To remove confusion it is recommended that the term steelhead be reserved for rainbows, and rainbows alone, which have migrated to sea or larger bodies of water.

Rainbows that migrate from streams and rivers to large landlocked freshwater lakes are called steelheads in some sections of the country. The rainbow, including the steelhead clan, is the most widely distributed member of the trout family.

NAMES [illegible] Coaster, Coast [illegible]on [illegible]es [illegible]t, [illegible]th [illegible]an [illegible]or [illegible]h- [illegible]n- [illegible]e, [illegible]il [illegible]ll [illegible]ed [illegible]ns

When the rainbow migrates to sea and becomes a "steelhead," the vivid freshwater coloring fades, the entire fish assumes a light, steel-blue or silvery sheen and the dark spots become quite indistinct. The sides take on a pinkish cast and the bright coloration of the lateral band is not so conspicuous. Upon returning to fresh waters the "rainbow" markings again appear.

RANGE . . . While the rainbow trout originally was a westerner, found only on the Pacific slope of the Sierras, from California to Alaska, it now has been successfully introduced into nearly all states except the southern part of those bordering the Gulf of Mexico.

Due to the fact that its eggs stand shipping unusually well, it has been successfully transplanted in Europe, Asia, Africa, Australia, New Zealand and South America. The sizes and numbers of rainbows taken in New Zealand and Chile are astounding.

Although the rainbow prefers the larger swift-flowing streams of the West, it does nicely in the smaller streams of the East, provided they have fast water and are not too small. In North Carolina rainbow trout are stocked annually from State fish hatcheries, and are widely distributed throughout the mountain streams in the western part of the state. The rainbow loves swift water and will be found in the fast stretches rather than the slow-moving currents.

Fish for them at the edge of strong currents and at the head of rapids or under overhanging banks where the current is swiftest.

SIZE . . . The world's record rainbow, caught on rod and reel, was taken by Wes Hamlet in Pend d'Orielle Lake, Idaho, Nov. 25, 1947. It weighed 37 pounds.

The size of the rainbow depends almost entirely upon the waters from which it is caught. On small streams the average will approximate 1 pound. In larger streams and rivers, or fair-size lakes, the

average weight will be 2 to 4 pounds, and 5 to 6 pounders are not rare.

Sea-run rainbow, or steelhead, that have migrated to sea or to large inland lakes are much larger than those that have not migrated. They will average 6 to 10 pounds, and while 15 to 20 pounders are scarce, they are not unusual.

FLAVOR . . . Excellent when taken from wilderness streams; only fair when not in prime condition or when freshly released from hatcheries.

FOODS . . . Insects in the larvae and mature stages, worms, flies, minnows, crustaceans and salmon eggs.

LURES . . . Fly fishermen find rainbows will yield to the temptation of wet and dry flies in tiny 18 and 20 sizes as well as the larger 6, 8 and 10 sizes; also, streamers, salmon flies, bucktails, salmon eggs, spoons and spinner and fly combinations. Small lures like the propper spook and wilder dilg minnow are ideal.

Plug casters take them on small lures in the ⅜ oz. and under class, like the midget river runt or midgit digit; in large bodies of water where the rainbow reaches giant proportions, large wobbling plugs and spoons produce.

METHODS . . . For ordinary rainbows, fly rod fishing with either live or artificial bait produces the majority of catches.

Still-fishermen with casting rods take a fair share and spinning rod enthusiasts find this fish ideal. However, for steelhead in large lakes the popular method is unquestionably trolling.

TACKLE . . . Fly fishing the ordinary streams for rainbows calls for standard fly fishing tackle such as fly rods made of tempered, split bamboo in light - trout or standard - trout actions. Leaders should be as light as possible and the reel either single action, or automatic.

Any standard wet or dry flies ranging from the tiniest sizes up to large streamers will be found alternately good. Small fly rod spoons, bucktails and wobbling lures like the midget river runt are excellent in deeper, larger streams.

Casting rods in the 5 and 5½-foot lengths, lighter actions, when used with the smaller casting lures like river runts in both floating and diving models, are becoming more popular each year. The lighter test lines in the 6 to 10-pound range are preferred together with a lightweight casting reel. A long nylon leader of equal poundage should be used.

Spinning is ideal in some of the larger streams, for with this type of outfit it is possible to attach a ⅛ or 1/16 oz. weight to a fly and cast it much farther than it is possible to reach with a fly rod or casting rod.

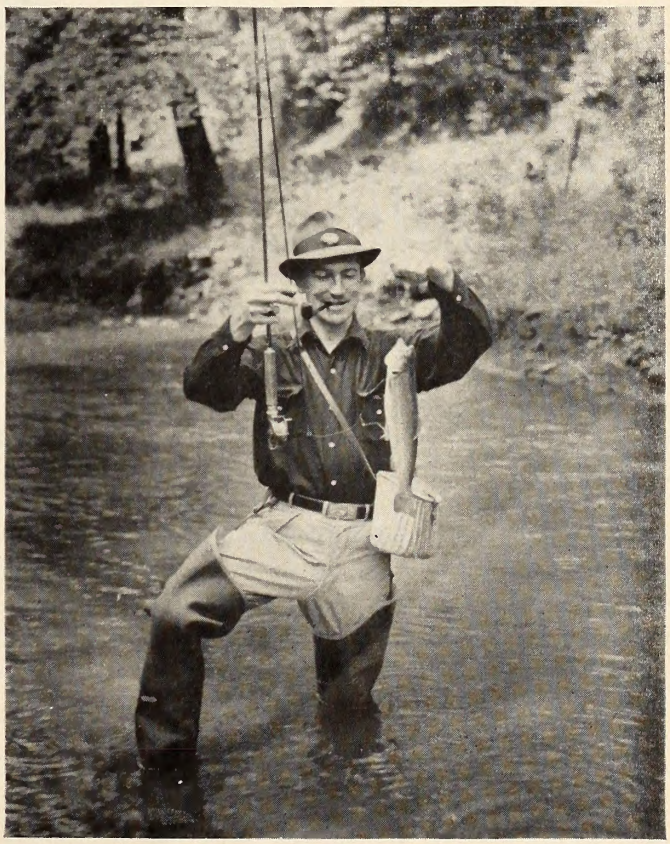
Most trolling for rainbows is done only in the larger lakes and streams, and the standard lightweight casting rods and casting reels are excellent. The use of all-nylon leader is recommended and any of the smaller lures such as midget river runt or midgit digit are productive. Some trollers prefer the stiffer action fly rods and troll slowly around the "drop-off"—that is, where the shoreline suddenly drops into deep water.

KAMLOOPS (RAINBOW) TROUT

In the past, many scientists classified this trout as a separate kind, KAMLOOPS or KOOTENAY TROUT, *Salmo Kamloops*. Now, however, it is agreed that this is merely a giant rainbow grown to gargantuan proportions because of ideal environment.

This particular trout has attracted nationwide attention to Lake Pend d'Orielle, Idaho, where they were not native but were introduced in 1942 when a planting was made. Almost immediately, a new world's record was set and has been broken every succeeding year since.

The explanation for this phenomenal growth is the super-abundance of small blueback salmon upon which these rainbow trout feed almost incessantly. Most of these trout are taken by trolling at an unusually fast speed; large plugs are used and standard deep-water trolling outfits are preferred.

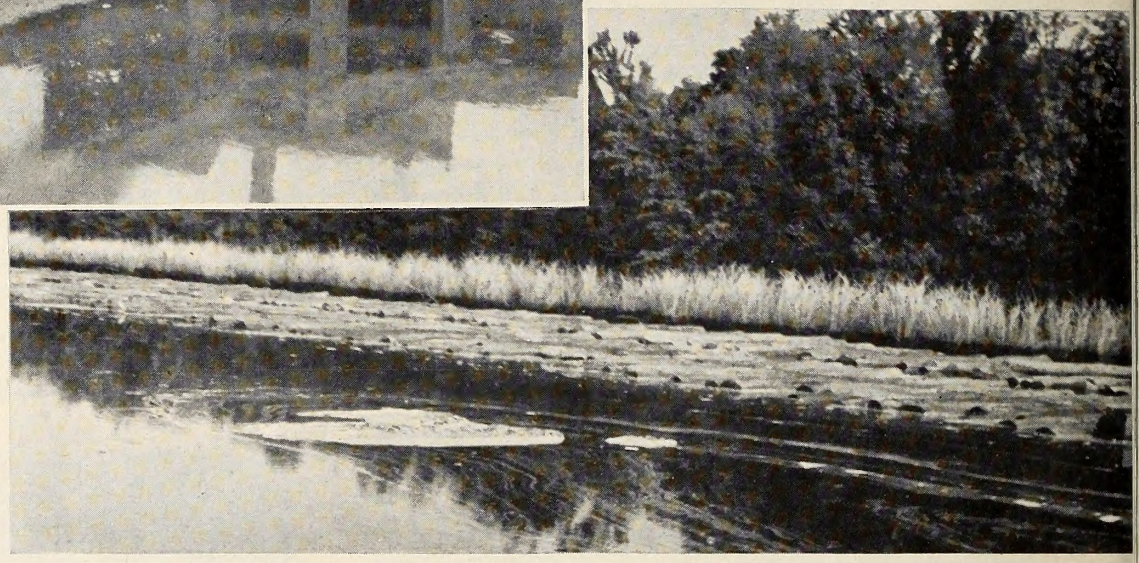


Large streams tend to produce large rainbows if there is enough natural food present throughout the year. The size of this one accounts for the pleased expression of the fisherman.

Earthworms are one of the most important contributing factors to soil productivity throughout the world. This fact was first a theory of Darwin—who proved it.

POLL

PER



Industrial waste and untreated sewage are the greatest sources of pollution.

No subject in the whole conservation field has received so much talk and so little action as water pollution. If there is any subject under the sun that has been investigated to death, it is water pollution —and yet, according to the latest version of Congressional action on so-called "pollution control bills," Congress would spend another $126,500,000 over a five-year period "to support and aid technical research to devise and perfect methods of treatment of industrial wastes which are not susceptible to known effective methods of treatment."

Here is a brief history. Twenty-six years ago the Izaak Walton League of America recognized water pollution as the No. 1 conservation problem needing attention. Twelve years ago, after much good work at the local and state level, we came to the realization that the sum total of water pollution had increased during that period. Then we initiated the present movement for Federal control with the introduction of the Lonergan bill in January, 1936.

At that time all of the industrial polluters lined up in solid opposition. They were aided and abetted by narrow pussy-footing health authorities who seemed more study-minded than action conscious, who contended that state control was adequate and given a reasonable period, indicated as ten years, the states would solve the pollution problem.

Again another twelve years has elapsed and, again, under state control, we have a great increase of pollution throughout these United States.

It is idle to contend that state control is adequate when existing pollution is the result of state control or lack of it. We must be realists, and when we are we will realize that the inequalities of state laws and their unequal measure of enforcement will never get the job done. The old argument of industry that to enact or enforce a state law on pollution would penalize industry, put it at a competitive disadvantage with the industries of other states and drive it out of the state, has been effective both against the enactment of adequate state laws, and even after their enactment has largely prevented their enforcement.

Chief Justice Holmes once said: "The only thing that makes taxes bearable is their uniformity," and in the same manner, the only thing that will make pollution control effective will be the uniformity of its application, and the only way we can bring about that uniformity is through some sort of Federal control, at least in the background.

Interstate compacts have also been strongly advocated by those desiring to avoid Federal control. In theory they are fine, but in practice they don't work. In spite of all the fanfare on interstate compacts, and particularly the Ohio Valley compact

UTION—
THE
ENNIAL PROBLEM

By Kenneth A. Reid, *Executive Director*
Izaak Walton League of America

which has been many years in the making, if you will examine the wording you will find that they contain the veto power which nullifies all their other fine mandatory declarations against pollution. They are, in effect, another means or method of stalling off the Federal control that will inevitably be necessary to get the job on pollution done.

The present Congress had five pollution control bills to consider. At the hearings all responsible agencies having any interest in correcting water pollution agreed on two basic principles that should be included in any legislation adopted, and so testified at the hearings. These were:

1. A ban on the spread of pollution from new outlets, so that the line could be held while corrective measures provided in the bill were applied to existing pollution.

2. While recognizing the primary responsibility and authority of the states to correct their own pollution, there must be in the background adequate Federal authority to be invoked if, and when, the states demonstrate either their inability or unwillingness to do their own job.

Only the Mundt bills, H.R. 123 and H.R. 3990, contained the first of these essentials. The Barkley bill, S. 418, which was the one that received action by Congress, was lacking in the ban on pollution from new outlets. When it was reported out of the Senate Public Works Committee, it carried an amendment hamstringing the Federal authority by requiring the consent of the affected state before the Federal authority could come in. This was bad enough, but after it had reposed for several months in a subcommittee of the House Public Works Committee, headed by Congressman Auchincloss of New Jersey, it emerged with other amendments that made it a liability instead of an asset for the correction of water pollution.

The objectionable House amendment declared it to be the policy of Congress "to support and aid technical research to devise and perfect methods of treatment of industrial wastes which are not susceptible to known effective methods of treatment." It is hard to believe that the House Committee members who framed this amendment were so naive as to believe that this amendment was needed to effect the purposes of the bill. The effect of this amendment is two-fold. 1. It admits that for the great majority of industrial wastes there are no know effective methods of treatment. It encourages industry to make this claim, even though it may, and in most cases does, know how to treat its own wastes. 2. It transfers from industry, where the responsibility belongs, to the government, where the responsibility does not belong, the job for discovery and development of industrial waste treatment methods.

The net effect is to give industry a legal alibi to sit back and do nothing, while the government at a total cost to the taxpayers over a five-year period of $126,500,000, attempts to duplicate the job of research in industrial waste treatment methods which in most cases has already been done by industry. This vicious amendment makes of the measure an industrial polluter's protective measure and grants them a moratorium for continuing present polluting practices for at least another five years. Congressmen and senators who prated about economy and still approved such a measure should hang their heads in shame.

The bill, as passed by the Senate, was weak and inadequate, but it was a very small step forward. Conservationists were willing to accept it as a start with the full knowledge that it would need to be strengthened in future Congresses to make it really work. But, the House amendment put a totally different complexion on the whole bill. Instead of a small step forward, it was a big step backward, postponing for at least five years any real corrective action.

We have had studies and investigation on water pollution for fifty years. Tons of unused documents are gathering dust in hidden archives. Only a few years ago Congress spent $648,000 of the taxpayers' money to make a comprehensive water pollution survey of the Ohio River—yet the proposed bill, instead of taking action on that survey would authorize another survey and a laboratory at an expense of four million dollars.

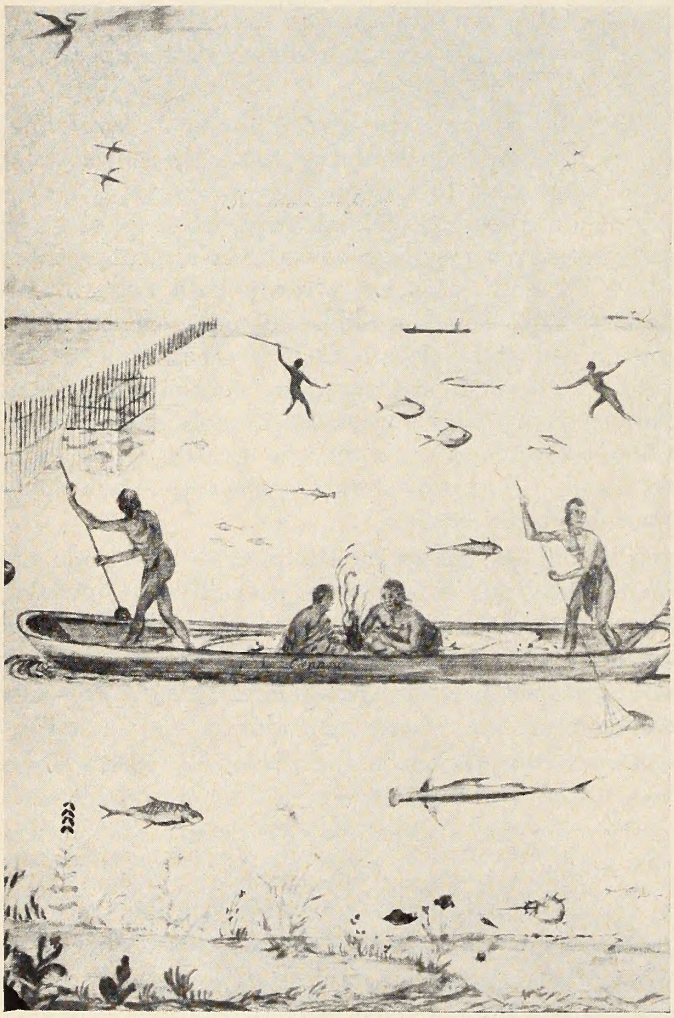
The time for stalling is ended. The remedy for the problem is simple. Congress should face the issue squarely and enact a simple law, embodying the two agreed principles mentioned above. Then it would find that the many so-called "unsolved problems" would be quickly solved, and that no one would be hurt, for all the inequalities existing today by reason of unequal state laws, or their unequal enforcement, would evaporate into thin air. All industries in interstate competition would be on

(Continued on page twenty-one)

"Of BEASTS, BIRDS and FISH"

Here Is An Account of Wildlife Conditions in North Carolina as The Early Explorers Found Them

Compiled and edited by Wm. E. McConnaughey, III
Game Habitat Restoration



". . . he fell to fishing, and in less than half an hour had laden his boat as deep as it could swim . . ." (Courtesy Dept. of Archives and History.)

The early travellers and explorers of North Carolina invariably noticed and recorded the abundance of all forms of wildlife they saw. In July 1584, the two barks sent out from England, by Sir Walter Raleigh, under the command of Philip Amadas and Arthur Barlowe, dropped anchor in Roanoke Sound. Longboats brought them ashore where the country was possessed "in the right of The Queen's most excellent majesty." Having finished this ceremony Barlowe writes, "We passed from the seaside toward the tops of those hills next adjoining, being but of mean height, and from thence we beheld the sea on both sides, to the north and to the south finding no end any of both ways . . . . Under the bank whereon we stood we beheld the valleys replenished with goodly cedar trees; and having discharged our harquebus[1] shot, such a flock of cranes (the most part white) rose under us, with such a cry, redoubled by many echoes, as if an army of men had shouted altogether.

"This island had many goodly woods full of deer, conies,[2] hares and fowl, even in the midst of summer, in incredible abundance."

On the third day Indians were first seen, and Barlowe's account of their visit to the ships makes the modern angler wish for those days. One of the Indians came aboard ship. "And after he had spoken of many things not understood by us, we brought him, with his own good liking, aboard the ships, and gave him a shirt, a hat and some other things, and made him taste of our wine and meat, which he liked very well; and having viewed both barks he departed and went to his own boat again, which he had left in a little cove or creek, adjoining. As soon as he was two bowshot into the water he fell to fishing, and in less than half an hour he had laden his boat as deep as it could swim, with which he came again to the point of land, and there divided his fish into two parts, pointing one part to the ship and the other to the pinnace."

Trading naturally followed this friendly intercourse. That the English were not adverse to driving a hard bargain is shown by Barlowe's account of the barter. "A day or two after this we fell to trading with them, exchanging some things that we had for chamoys, buff and deer skins . . . . We exchanged our tin dish for twenty skins, worth twenty crowns or twenty nobles, and a cooper kettle for fifty skins, worth fifty crowns."

Game and fish were presented regularly to the Englishmen and Barlowe noted the excellent quality of these gifts. "He [Granganimeo] sent us every day a brace or two of fat bucks, conies, hares, fish, the best in the world."

The first detailed account of North Carolina's game and fish resources was prepared by Thomas Heriot, who was a member of the exploratory party sent out in 1586 for a year. Heriot, like his predecessor Barlowe, was a close observer of wildlife and devoted considerable space to listing various animals,

[1] A firearm of the fifteenth century.
[2] Rabbit.

birds and fish. "*Furs.* All along the seacoast there are great store of otters, which being taken by weares and other engines made for purpose will yield good profit. We hope also of marten furs, and made no doubt by the relation of the people, but that in some places of the country there are stores, although there were but two skins that came to our hands. Luzernes[3] also we have understanding of, although for the time we saw none.

"Deer skins dressed after the manner of chamoes, or undressed are to be had of the natural inhabitants thousands yearly by way of traffic for trifles, and no more waste or spoil of deer than is or has been ordinarily in time before.

"*Civet Cats.* In our travels there was found one to have been killed by a savage or inhabitant and in another place the smell where one or more had lately been before, whereby we gather, besides then by the relation of the people, that there are some in the country: good profit will rise by them.

OF BEASTS

"Deer, in some places there are great store. Near unto the seacoast they are of the ordinary bigness of ours in England and some less, but further up into the country, where is better food, they are greater. They differ from ours only in this, their tails are longer and the snags of their horns look backward. Conies. Those that we have seen, and all that we can hear of are of a gray color like unto hares. In some places there are such plenty that all the people of some towns make them mantles of the fur or flue of the skins of those which they usually take. Saquenuckot and maquowoc,[4] two kinds of small beasts greater than conies, which are very good meat. We never took any ourselves, but sometimes eat of such as the inhabitants brought unto us. Squirrels, which are of a gray color, we have taken and eaten. Bears, which are of a black color.

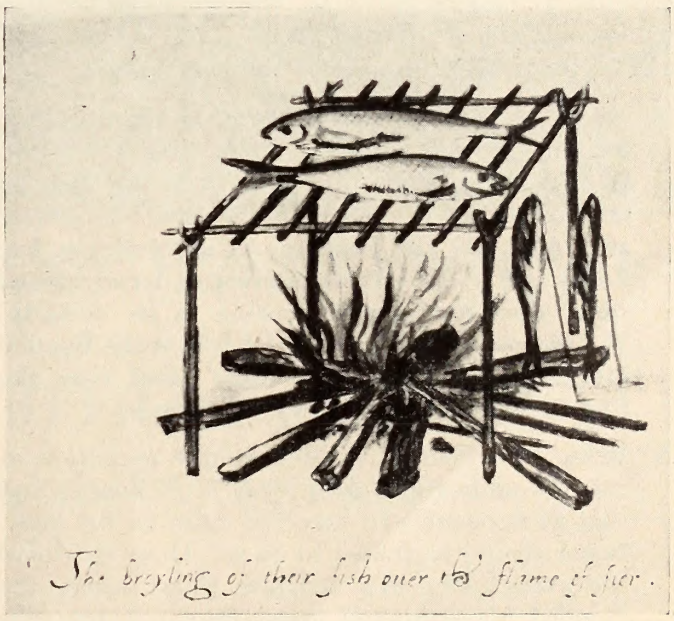
"The bears of this country are good meat. The inhabitants in time of winter do use to take and eat many. So also sometimes did we. They are taken commonly in this sort. In some islands or places where they are, being hunted for as soon as they have espied of man, they presently run away, and then being chased, they climb and get up the next tree they can. From whence with arrows they are shot down stark dead, or with those wounds that they may after easily be killed. We sometimes shot them down with our calievers.[5]

"I have the names of eight and twenty several sorts of beasts, which I have heard of to be here and there dispersed in the country, especially in the main,[6] of which there are only twelve kinds that we have yet discovered, and of those that be good meat we know only them before mentioned. The inhabitants sometimes kill the lion,[7] and eat him. And we sometimes as they came to our hands of their wolves or wolfish dogs, which I have not set down for good meat, lest that some would understand my judgment therein to be more simple than needeth, although I could allege the difference in taste of those kinds from ours, which by some of our company have been experimented in both.

OF FOWL

"Turkey cocks and turkey hens, stockdoves, partridges, cranes, hernes,[8] and in winter great store of swans and geese. Of all sorts of fowl I have the names in the country language of fourscore and six, of which number, besides those that be named, we have taken, eaten, and have the pictures as they were drawn, with the names of the inhabitants, of several strange sorts of water fowl eight, and seventeen kinds more of land fowl, although we have seen and eaten of many more, which for want of leasure there for the purpose could not be pictured. And after we are better furnished and stored upon further discovery with their strange beasts, fish, trees, plants, and herbs, they shall be also published.

"There are also parrots,[9] falcons, and marlin hawks, which although with us they be not used for meat, yet for other causes I thought good to mention.



". . . fish . . . which we found to be most delicate and pleasant meat." (Courtesy Dept. of Archives and History.)

OF FISH

"For four months of the year, February, March, April and May, there are plenty of sturgeons. And also in the same months of herrings, some of the ordinary bigness of ours in England, but the most part far greater, of eighteen, twenty inches, and some two feet in length,[10] and better. Both these

(Continued on page twenty-one)

[3] A variety of lucen, a lynx.
[4] Probably raccoon and opossum.
[5] A firearm.
[6] Mainland.
[7] Mountain lion.
[8] Herons
[9] Parrakeet.
[10] These were shad.

GET IT OFF YOUR CHEST!

EDITORIAL COMMENT, LETTERS TO THE EDITOR AND ANECDOTES

Conducted by WIN DONAT

Thanks to response from you readers it is no longer necessary (not for this issue at least) to plead with you for questions as all of the questions discussed on this page have come in by mail as direct response. Believe me, it is gratifying to know that the interest is building up. We look forward to a continued growing interest and hope that the subjects discussed will be of increasing value and amusement. By the way, don't forget there may be many things that we say that are open to further discussion, so let's continue to hear from you.

While we may be just a bit late, we hope that this Season's joys were the greatest ever and that they will be magnified throughout the coming year.

Q. Mr. C. M. McA. of Wilmington, North Carolina, has run afoul a question concerning fowl, and is perturbed over the fact that the federal authorities have classed the Hooded Merganser as a duck for the purposes of determining bag limits and writes a most interesting letter, which space does not permit quoting in its entirety. The net conclusion of his letter is that the Hooded Merganser is of no more table value than the Red-Breasted or American Merganser.

A. Being somewhat of a duck hunter myself, it is easy to understand Mr. McA.'s quandary, and if it were possible to take two sides on the question I should be forced to do so. However, there are areas along the Atlantic Coast where the Hooded Merganser is taken for the table with equal choice between the ruddy ducks, scaup, and golden-eye, and believe it or not, is preferred to some of these ducks. While it is unquestionably a fish eater and has the sawtooth bill, which probably establishes a prejudice against it as soon as it is killed, nevertheless I have eaten hairy-crowns, as they are sometimes called, and found them not too bad. To be more specific as to areas where they consider these Mergansers good eating, I should name the upper Currituck Sound and the entire Back Bay in Virginia.

Q. Mr. T. D. of Plymouth, North Carolina, believes in plenty of artillery, as he wants to know "if it is lawful to carry a pistol on hunting trips in addition to a shotgun or a rifle, . . . and is it necessary to have a special permit to carry same."

A. The best of the information we have been able to gather on the restrictions against the carrying of pistols is that they must not be concealed and that no permit is required to carry one. However, a permit costing fifty cents is required in order to purchase one. Therefore, it is our opinion that it is not unlawful to carry a pistol while hunting.

Q. This is one time that a lady scores on her husband. Mrs. J. M. L. of Newton Grove, North Carolina, asks us to confirm "whether or not quail have ever been hunted in North Carolina by men on horseback driving a previously located covey into a net."

A. Strangely enough this method of capturing quail has been used in North Carolina, and the story was told directly from the lips of an octogenarian who witnessed the procedure. While it is probably true that this method was feasible back in the days when there were plenty of birds and they used the open stubble and broomstraw fields to a greater extent than they do at present, nevertheless, the routine was something like this: A covey of birds would be located in a field and a knitted net, more or less funnel shaped with two wings spreading out from the opening, was placed and a group of mounted men very carefully closed in towards the opening of the net, thereby driving the birds on the ground. Incidentally, this subject is sufficiently interesting so that we would welcome additional discussion if any of our readers know of more complete information. This is the kind of question we like to have submitted.

Q. Mr. H. D. of Asheville, North Carolina, asks a question which should concern numerous state

Birds and animals find it difficult to secure food during periods of heavy snow fall. Winter feeding stations are helpful in places like this.

WINTER IS THE CRITICAL PERIOD

The following is quoted from a letter from R. L. Cline, President of the Alamance County Wildlife Club:

"At the meeting last night there was a unanimous vote to procure feed for quail to be distributed by the members of the club in case there are heavy snows and sleets this year as there were last year.

"Upon voting to do this I appointed a committee of three to attend to the matter. Mr. Vance Perry, our local game protector, assured us that the Commission would furnish a plane to distribute feed if it became necessary to do so. . . ."

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LET'S TEACH OUR YOUTH THE MEANING OF CONSERVATION

Stanley Winborne
Utilities Commission
Raleigh, N. C.